

INDIANA FIRE ACADEMY TRAINING SYSTEM
A Division of Indiana Homeland Security

Hazardous Material Technician



Evaluator Hazardous Material Technician Practical Skills

Reference material needed for this course:

NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents 2008/2013 Ed.

**Fire Protection Publications, Hazardous Materials: Managing the Incident, 2nd Ed,
ERG, Emergency Response Guidebook, 2012 Ed.**

Hazardous Materials Technician Lead Evaluator Handbook

The skill sheets contained in the Hazardous Materials Lead Evaluator Handbook meet NFPA 472 2008 & 2013 editions. Each of the operational skill sheets (metering devices, product control and PPE) are constructed to simulate an emergency incident and can be utilized in scenario based instruction and evaluation. During the instructional phase student only need to complete the functional part of the skill sheet. For instance, using the skill sheet for "Overpack Slide-In Method" the student should focus on and complete steps 4 through 11. The remaining steps address PPE, approach, spill control and decontamination. These steps can be injected once the students show competency in performing the main objective of the skill sheet. To qualify for certification ALL skills must be accomplished unless otherwise indicated in the directions. With the exception of household item used in the monitoring section the use of actual hazardous materials is not permitted during certification testing.

Hazard Detection and Monitoring

Perform maintenance and testing on monitoring equipment, test strips, and reagents. (NFPA 472, 7.2.1.3.6)

Directions

For this skill students will perform routine maintenance and testing on various types of monitoring equipment, test strips, and reagents. Always follow manufacturer's procedures.

Equipment & Materials

- Monitoring equipment, test strips, and reagents
- Manufacturer's operator's manual
- Maintenance equipment such as calibration gases or other necessary items
- Appropriate personal protective equipment (PPE)
- Equipment maintenance log/forms

Skills Evaluation Checklist

Task Steps Multi-Gas Monitor	
1.	Turn the device on.
2.	Check the status of the battery.
3.	Allow the device to warm up.
4.	Ensure the device is "zeroed," or not picking up any readings while in a clean environment. Perform a pump test.
5.	Perform the appropriate bump test.
6.	Allow the device to return to zero.
7.	Review other functions (data logging, screen illumination, low battery alarm, etc.) per manufacturer's instructions.
8.	Identify established action levels and instrument setting for alarm points.

Task Steps Colorimetric Tube

1.	Determine the need for using colorimetric tubes.
2.	Select the correct tube or set of tubes for the mission.
3.	Connect all parts of the tube sampling system.
4.	Ensure an unreacted, unopened tube is available.
5.	Perform a pump/bellows test. <ul style="list-style-type: none">• Depress bellows• Insert unopened tube into tube opening on the bellows• Release bellows• If the bellows remains depressed then proceed with monitoring• If the bellows inflates then you must replace the bellows

Demonstrate the use of a multi-gas meter to identify hazards. (NFPA 472 7.2.1.3.5 (1, 3 & 4))

Directions

For this skill students will demonstrate the use a multi-gas meter in order to identify hazards. These instruments may detect carbon monoxide, oxygen, combustible gases, and others as determined. Always follow manufacturer's recommendations when performing all procedures.

Note: If the unit is equipped with a PID it is recommended to conduct the PID skill sheet in conjunction with this one.

Equipment & Materials

- Multi-gas meter
- Manufacturer's operator's manual
- Cleaning supplies recommended by manufacturer
- Appropriate personal protective equipment (PPE)
- Product, container, or area to be tested, as identified by instructor

Skills Evaluation Checklist

Task Steps	
1.	Select a four or five gas meter.
2.	Perform a bump test and fresh air calibration.
3.	Determine if the meter is ready for use and report the results to the instructor.
4.	Don appropriate PPE, make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
5.	Properly monitor the area. <ul style="list-style-type: none">• Enter area slowly• Conduct a complete site survey (360° around spill)• Mark readings from multiple points
6.	Exit the monitoring area and report readings to the instructor.
7.	Advance to decontamination line for decontamination.
8.	Clean the monitor as per the manufacturer's instructions.

Demonstrate the use of pH meter to identify hazard. (NFPA 472 7.2.1.3.5 (6 & 9))

Directions

For this skill students will conduct a product test using pH meters and pH paper to determine corrosivity. Always follow manufacturer's recommendations.

Equipment & Materials

- pH meter and pH paper
- Manufacturer's operator's manual
- Appropriate personal protective equipment (PPE)
- Liquid with known pH
- Product
- Cleaning supplies recommended by manufacturer

Task Steps pH Meter

1.	Turn on the pH meter.
2.	Ensure the meter is calibrated per manufacturer's instructions.
3.	Once calibrated, rinse and dry the electrode.
4.	Don appropriate PPE, make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
5.	Obtain a sample and return it to the warm zone for testing.
6.	Conduct pH test and report readings to the instructor.
7.	Advance to decontamination line for decontamination.
8.	Return the meter to ready for service condition.
9.	Record readings.

Task Steps pH paper

1.	Remove a 3-4 inch piece of pH paper from the roll or remove a strip from the container.
2.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
3.	When approaching the product, determine the presence of corrosive vapors by waving wetted test paper in atmosphere.
4.	If vapors do not exist, take sample of liquid product using a pipette attempting to not come into contact with the material or dip the pH paper into the product. Note: If necessary, attach strip to long rod or pole to ensure that user does not come into contact with material.

Task Steps pH paper

5.	Compare results to pH paper chart to determine if the product is an acid, a base, or neutral. Note: Confirmation of a corrosive atmosphere will eliminate the use of electronic meters for further testing.
6.	Dispose of contaminated test paper accordingly.
7.	Advance to decontamination line for decontamination.

Demonstrate the use of colorimetric tubes to identify hazard. (NFPA 472 7.2.1.3.5 (2))

Directions

For this skill students will conduct a product test using colorimetric tubes to determine the hazard zone. Always follow manufacturer's recommendations.

Equipment & Materials

- Colorimetric Tubes
- Manufacturer's operator's manual
- Appropriate personal protective equipment (PPE)
- Bellows
- Product
-
-

Task Steps Colorimetric Tube

1.	Determine the need for using colorimetric tubes.
2.	Select the correct tube or set of tubes for the mission.
3.	Connect all parts of the tube sampling system.
4.	Ensure an unreacted, unopened tube is available.
5.	Perform a pump/bellows test. <ul style="list-style-type: none">• Depress bellows• Insert unopened tube into tube opening on the bellows• Release bellows• If the bellows remains depressed then proceed with monitoring• If the bellows inflates then you must replace the bellows
6.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
7.	Enter hazard area and conduct readings.
8.	Exit hazard area and report findings to the entry team leader.
9.	Advance to decontamination line for decontamination.

Demonstrate the use of reagent test strips to identify hazards. (NFPA 472 7.2.1.3.5 (10))

Directions

For this skill students will conduct a product test using chemical reagent test strips to identify the substance.

Equipment & Materials

- Reagent test strips
- Manufacturer's instructions
- PPE
- Product

Task Steps	
1.	Ensure the test strips are correct for the product and in date.
2.	Ensure that the test strips are not out of date.
3.	Remove one strip from the container.
4.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
5.	Use a syringe or pipette to gain a sample and apply it to the test strip.
6.	Identify any changes to the strip and compare them with the provided chart.
7.	Report significant findings to the entry team leader.
8.	Dispose of contaminated test paper accordingly.
9.	Advance to decontamination line for decontamination.

Demonstrate the use of radiation detection instruments to identify hazards. (NFPA 472 7.2.1.3.5 (8))

Directions

For this skill students will use radiological detectors for area monitoring to determine the presence of radioactive materials. Always follow manufacturer's instructions.

Equipment & Materials

- Radiation detection instrument(s)
- Manufacturer's operator's manual
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- PPE
- Radioactive source
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Task Steps	
1.	Ensure radiological monitor is functional and in calibration.
2.	Turn on the meter and acquire background radiation levels.
3.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the product.
4.	Properly monitor the area. <ul style="list-style-type: none">• Enter area slowly• Conduct a complete site survey• Take readings from all levels to account for falling particulate
5.	Determine the presence of alpha, beta, and gamma radiation.
6.	Report findings to the instructor.
7.	Advance to decontamination line for decontamination.
8.	Return the device to service as per manufacturer's instructions.

Demonstrate the use of passive dosimeters to identify hazards. (NFPA 472 7.2.1.3.5 (5))

Directions

For this skill students will don a passive dosimeter and monitor radiological exposure levels. This skill should be conducted in conjunction with the radiological monitoring skill.

Equipment & Materials

- Dosimeter
- Manufacturer's instructions
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- PPE
- Exposure log
-

Task Steps

1.	Ensure the dosimeter is in date and reads zero.
2.	Start an exposure log ensuring the unit and person match.
3.	Don the dosimeter as per manufacturer's instructions.
4.	Record dosimeter readings once the hazard zone has been exited.
5.	Follow decontamination and medical protocols based on readings.

Demonstrate the use of photo-ionization and flame ionization detectors to identify hazards.
(NFPA 472 7.2.1.3.5(7))

Directions

For this skill students will use a photoionization detector and/or a flame ionization detector for area monitoring to determine the any hazards present.

Equipment & Materials

- Photo-ionization detector(s)
- PPE
- Flame ionization detector(s)
- Product
- Manufacturer's operator's manual
- Cleaning supplies

Task Steps pH paper	
1.	Select a photoionization and/or a flame ionization detector. Identify and apply conversion factors as necessary.
2.	Perform a fresh air calibration.
3.	Determine if the meter is ready for use and report the results to the instructor.
3.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
4.	Properly monitor the area. <ul style="list-style-type: none">• Enter area slowly• Conduct a complete site survey (360° around spill)• Mark readings from multiple points
5.	Exit the monitoring area and report readings to the instructor.
6.	Advance to decontamination line for decontamination.
7.	Clean the monitor as per the manufacturer's instructions.

Demonstrate the use of WMD detectors (chemical and biological) to identify hazard. (NFPA 472 7.2.1.3.5 (11))

Directions

For this skill students will use WMD detectors for area monitors to determine the presence of chemical or biological hazards and conduct site characterization.

Equipment & Materials

- WMD Detectors(Chemical and Biological)
- Manufacturer's operators manual
- PPE
- Cleaning supplies per manufacturer
- Product
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Task Steps	
1.	Determine appropriate WMD monitor based on incident conditions.
2.	Make necessary law enforcement notifications.
3.	Perform appropriate pre-use checks.
4.	Determine if the meter is ready for use and report the results to the instructor.
5.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
6.	Properly monitor the area. <ul style="list-style-type: none">• Enter area slowly• Conduct a complete site survey (360° around spill)• Mark readings from multiple points• Obtain a product sample for verification and evidence
7.	Exit the monitoring area and report readings to the instructor.
8.	Advance to decontamination line for decontamination.
9.	Conduct sample monitoring in a safe location and ensure evidence is turned over to law enforcement. Ensure that evidence is not left unattended for chain of custody requirements.
10.	Clean the monitor as per the manufacturer's instructions.

Task Steps	

Demonstrate the methods for collecting samples of a solid, liquid and a gas. (NFPA 472 7.2.1.5)

Directions

For this skill students will obtain samples of a solid, liquid and gas for identification and evidence collection.

Equipment & Materials

- Spoons or scoops
- Pipettes or syringes
- Air sample bags
- Jars and bags
- Labels
- Vacuum pumps
- Products
- PPE
- Chain of custody log
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Task Steps	
1.	Assemble the sampling kit and sample containers.
2.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
3.	Collect solid sample <ul style="list-style-type: none"> • Ensure sample equipment is clean • Use spoon/scoop to place the solid product into a sample jar • Decontaminate the sample jar when exiting the hazard zone • Label the jar and place it in a bag for transport to testing location • Complete chain of custody logs and reports
4.	Collect liquid sample <ul style="list-style-type: none"> • Ensure sample equipment is clean • Use a pipette/syringe to draw the liquid product into a sample jar • Decontaminate the sample jar when exiting the hazard zone • Label the jar and place it in a bag for transport to testing location • Complete chain of custody logs and reports

Task Steps	
5.	Collect gas sample <ul style="list-style-type: none"> • Ensure sample equipment is clean • Use a vacuum pump to draw the gas product into the gas sample bag • Decontaminate the sample bag when exiting the hazard zone • Label the gas sample bag and place it in a bag for transport to testing location • Complete chain of custody logs and reports
6.	Exit the monitoring area and report readings to the instructor.
7.	Advance to decontamination line for decontamination.

Given a solid, liquid and a gas, identify or classify each by hazard. (NFPA 472 7.2.1.3)

Directions

For this skill, students, using air monitoring priorities, site characterization techniques and appropriate air monitoring equipment will identify or classify three unknown substances (a solid, liquid and a gas).

Equipment & Materials

- Multi-gas meter
- Radiological meter
- pH meter/paper
- PID/FID
- Colormetric Tubes
- Chemical test strips
- Products
- PPE
- Simulated hazard zone
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Task Steps	
1.	Select the appropriate instrument(s) for the task.
2.	Properly prepare the instrument(s) for use.
3.	Prioritize your monitoring areas.
4.	Develop an overall monitoring plan.
5.	Establish action levels (readings from the devices) prior to entering the scene.
6.	Don appropriate PPE; make entry into the hot zone from uphill/upwind. Make certain that responders do not come in direct contact with the spilled product.
7.	Evaluate the suspect scene/substance for radioactivity
8.	Evaluate the suspect scene/substance for flammability
9.	Evaluate the suspect scene/substance for corrosive atmosphere
10.	Evaluate the suspect scene/substance for oxygen levels

Task Steps	
11.	Evaluate the suspect scene/substance for VOC's
12.	Exit the hazard area and report finding to the instructor
13.	Advance to decontamination line for decontamination.

Personal Protective Equipment

Don, work in, and doff self-contained breathing apparatus (SCBA). (NFPA 472, 7.4.2(3))

Directions

For this skill students will don, work in and doff SCBA.

The steps given in these skill sheets are general procedures for donning an SCBA. The specific SCBA manufacturer's recommendations for donning and use of the SCBA should always be followed.

Equipment & Materials

- Full chemical protective clothing including SCBA
- SCBA storage case or compartment
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Task Steps	
SCBA: Coat Method	
1.	Position SCBA with the valve end of the cylinder toward the body.
2.	Open cylinder valve. <ul style="list-style-type: none"> a. Low pressure alarm sounds b. Valve fully open c. Cylinder at least 90% full
3.	Check cylinder and regulator pressure gauges. <ul style="list-style-type: none"> a. Pressure readings within 100 psi OR needles on both pressure gauges

Task Steps	
SCBA: Coat Method	
	indicate same pressure
4.	Grasp the top of the left shoulder strap on the SCBA with the left hand and raise the SCBA overhead.
5.	Guide the left elbow through the loop formed by the left shoulder strap. a. Swing SCBA around left shoulder
6.	Guide the right arm through the loop formed by the right shoulder strap allowing the SCBA to come to rest in proper position.
7.	Fasten chest strap, buckle waist strap, and adjust shoulder straps.
8.	Don facepiece. a. Check facepiece seal b. No air leakage
9.	Connect air supply to facepiece. a. Take normal breaths
10.	Don CPE and perform assigned duties
11.	Advance to decontamination line for decontamination.
12.	Doffing will occur in reverse order of donning and be completed in the decontamination line.
13.	Return SCBA to pre-emergency condition.

OR

Task Steps	
SCBA: Over-the-Head Method	
1.	Position the SCBA with the valve end of the cylinder away from the body.
2.	Open cylinder valve. a. Low pressure alarm sounds b. Valve fully open c. Cylinder at least 90% full
3.	Check cylinder and regulator pressure gauges. a. Pressure readings within 100 psi OR needles on both pressure gauges indicate same pressure
4.	Raise the SCBA overhead while guiding elbows into the loops formed by the shoulder straps. • Grasp both sides of the harness assembly
5.	Release the harness assembly and allow the SCBA to slide down the back.
6.	Fasten chest strap, buckle waist strap, and adjust shoulder straps.
7.	Don facepiece. a. Check facepiece seal b. No air leakage
8.	Connect air supply to facepiece. a. Take normal breaths
9.	Don CPE and perform assigned duties

Task Steps	
SCBA: Over-the-Head Method	
10.	Advance to decontamination line for decontamination.
11.	Doffing will occur in reverse order of donning and be completed in the decontamination line.
12.	Return SCBA to pre-emergency condition.

OR

Task Steps	
SCBA: Seat Mount Method	
1.	Open cylinder valve. a. Low pressure alarm sounds b. Valve fully open c. Cylinder at least 90% full
2.	Check cylinder and regulator pressure gauges. a. Pressure readings within 100 psi OR needles on both pressure gauges indicate same pressure
3.	Position body in seat with back firmly against the SCBA. a. Release the SCBA hold-down device
4.	Insert arms through shoulder straps.
5.	Fasten chest strap, buckle waist strap and adjust shoulder straps.
6.	Fasten seat belt before apparatus gets underway.
7.	Don facepiece. a. Check facepiece seal b. No air leakage
8.	Connect air supply to facepiece. a. Take normal breaths
9.	Don CPE and perform assigned duties
10.	Advance to decontamination line for decontamination.
11.	Doffing will occur in reverse order of donning and be completed in the decontamination line.
12.	Return SCBA to pre-emergency condition.

Don, work in, and doff Air Purifying Respirator (APR). (NFPA 472, 7.4.2(3))

Directions

For this skill students will don, work in and doff Air Purifying Respirator.

The steps given in these skill sheets are general procedures for donning an Air Purifying Respirator. The specific APR manufacturer's recommendations for donning and use of the APR should always be followed.

Equipment & Materials

- Full Level C chemical protective clothing including APR
- APR Cartridge
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Task Steps

Air Purifying Respirator	
1.	Remove face piece from storage and inspect for damage, including the adjustable straps.
2.	Attach appropriate cartridge as required by the product.

Task Steps	
Air Purifying Respirator	
3.	Don APR face piece and ensure a proper seal.
4.	Don CPE and perform assigned duties.
5.	Doffing will occur in reverse order of donning and be completed in the decontamination line.
6.	

Don, work in, and doff Level A and Encapsulating Level B chemical protective ensemble. (NFPA 472, 7.4.2(4), 7.4.3(2).

Directions

For this skill students will correctly don, perform assigned duties and doff Level A or Encapsulating Level B chemical protective clothing.

Equipment & Materials

- Level A garment
- Chemical tape
- SCBA
- Hard hat
- Boots
- Gloves

Task Steps	
1.	Conduct a pre-entry safety briefing, pre-entry medical monitoring and a visual

Task Steps	
	inspection of PPE. Inspect SCBA and ensure functionality.
2.	Remove shoes, belts, and any objects that could damage suit.
3.	While seated, place both legs into suit and pull suit up to waist.
4.	Place feet into chemical boots and fold the suit boot covers over tops of boots.
5.	Don SCBA harness and facepiece but do not attach regulator to the facepiece.
6.	Turn on air supply, don SCBA facepiece, check seal and breathe normally to ensure SCBA operates properly.
7.	Don hard hat (if required by AHJ).
8.	Record beginning air pressure and perform a radio check.
9.	With assistance, place arms and head inside the suit, close the zipper, and shut closure.
10.	Perform incident control tasks as assigned, including: <ul style="list-style-type: none"> a. Close valves that are open b. Replace missing plugs c. Tighten loose plugs
11.	Advance to decontamination line for decontamination.
12.	To doff, remove PPE in reverse order of donning (accomplished in the Decontamination Line).
13.	Proceed to medical monitoring.
14.	
15.	

Don, work in, and doff Non-Encapsulating Level B chemical protective ensemble. (NFPA 472, 7.4.2(4), 7.4.3(2).

Directions

For this skill students will correctly don, perform assigned duties and doff Non-Encapsulating Level B chemical protective clothing.

Equipment & Materials

- Non-Encapsulating Level B garment
- Chemical tape
- Hard hat
- Boots

- SCBA
- Gloves

Task Steps	
1.	Conduct a pre-entry safety briefing, pre-entry medical monitoring and a visual inspection of PPE. Inspect SCBA and ensure functionality.
2.	Remove shoes, belts, and any objects that could damage suit.
3.	While seated, place both legs into suit and pull suit up to waist.
4.	Place feet into chemical boots and fold the suit boot covers over tops of boots.
5.	With assistance, complete donning the suit by placing both arms in the suit and pulling the suit over the shoulders.
6.	Close the chemical suit by closing the zipper and sealing the splash flap.
7.	Don SCBA harness and facepiece but do not attach regulator to the facepiece.
8.	Turn on air supply, don SCBA facepiece, check seal and breathe normally to ensure SCBA operates properly.
9.	Don hard hat and pull hood over head.
10.	Tape cuffs, zippers and voids as necessary.
11.	Record beginning air pressure and perform a radio check.
12.	Perform incident control tasks as assigned, including: <ul style="list-style-type: none"> a. Close valves that are open b. Replace missing plugs c. Tighten loose plugs
13.	Undergo technical decontamination as per AHJ SOPs.
14.	To doff, remove PPE in reverse order of donning (accomplished in the Decontamination Line).
15.	Proceed to medical monitoring.

Don, work in, and doff Level C chemical protective ensemble. (NFPA 472, 7.4.2(4), 7.4.3(2)).

Directions

For this skill students will correctly don, perform assigned duties and doff Level C chemical protective clothing.

Equipment & Materials

- Level C garment
- Chemical tape
- Hard hat
- Boots

- APR and Cartridge
- Gloves

Task Steps	
1.	Conduct a pre-entry safety briefing, pre-entry medical monitoring and a visual inspection of PPE. Inspect APR and cartridge to ensure it is not expired and is for the correct product.
2.	Remove shoes, belts, and any objects that could damage suit.
3.	While seated, place both legs into suit and pull suit up to waist.
4.	Place feet into chemical boots and fold the suit boot covers over tops of boots.
5.	With assistance, complete donning the suit by placing both arms in the suit and pulling the suit over the shoulders.
6.	Close the chemical suit by closing the zipper and sealing the splash flap.
7.	Don APR.
9.	Don hard hat and pull hood over head.
10.	Tape cuffs, zippers and voids as necessary.
10.	Perform a radio check.
11.	Perform incident control tasks as assigned.
12.	Advance to the decontamination line for decontamination.
13.	To doff, remove PPE in reverse order of donning (accomplished in the Decontamination Line).
14.	Proceed to medical monitoring.

Product Control

Drum Leaks

Contain a drum leak from the bung, chime, nail hole and forklift puncture. Overpack a drum using the Rolling Slide-In, Slide-In and Slip-Over methods (NFPA 472 7.4.3 (3 & 4))

Directions

For this skill students will contain a leak in a drum that is leaking from the bung, chime, nail hole and forklift puncture and Overpack the leaking drum.

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Appropriate tool
- Overpack Drum
- Drum with leaking bung, chime leak, nail hole and forklift puncture
- Plug and Patch kit
-

Task Steps Bung Leak

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Don necessary PPE and approach from uphill and upwind.
3.	Observe any conditions that would indicate reactivity with the container or other products.
4.	If product is flammable set up and perform firefighting foam application to effectively control vapors.
5.	Avoid direct contact with the material.
6.	Assess the location of the leak and stand up the drum to position the leak at the highest point.
8.	Using a standard bung wrench, tighten the bung or replace with a compatible bung.
9.	Check the drum to ensure the leak has stopped.
10.	Overpack the drum.
11.	Perform necessary spill control functions (damning, diking, diverting and retention)
12.	Advance to the decontamination line for decontamination.
13.	

Task Steps Chime Leak

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Don necessary PPE and approach from uphill and upwind.
3.	Observe any conditions that would indicate reactivity with the container or other products.
4.	If product is flammable set up and perform firefighting foam application to

Task Steps Chime Leak

	effectively control vapors.
5.	Avoid direct contact with the material.
6.	Assess the location of the leak and position the leak at the highest point.
8.	Use a compatible chemical patch that will bond with the container.
9.	Check the drum to ensure the leak has stopped.
10.	Overpack the drum.
11.	Perform necessary spill control functions (damning, diking, diverting and retention)
12.	Advance to the decontamination line for decontamination.
13.	

Task Steps Forklift Puncture

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Don necessary PPE and approach from uphill and upwind.
3.	Observe any conditions that would indicate reactivity with the container or other products.
4.	If product is flammable set up and perform firefighting foam application to effectively control vapors.
5.	Avoid direct contact with the material.
6.	Assess the location of the leak and position the leak at the highest point.
8.	Use a combination of compatible chemical patch material, wedges and commercial plugs/patches to slow/stop leaking material.
9.	Check the drum to ensure the leak has stopped.
10.	Overpack the drum.
11.	Perform necessary spill control functions (damning, diking, diverting and retention) to control runoff.
12.	Advance to the decontamination line for decontamination.
13.	

Task Steps Nail Puncture

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Don necessary PPE and approach from uphill and upwind.
3.	Observe any conditions that would indicate reactivity with the container or other

Task Steps Nail Puncture

	products.
4.	If product is flammable set up and perform firefighting foam application to effectively control vapors.
5.	Avoid direct contact with the material.
6.	Assess the location of the leak and position the leak at the highest point.
8.	Use a combination of compatible chemical patch material, commercial plugs/patches to slow/stop leaking material.
9.	Check the drum to ensure the leak has stopped.
10.	Overpack the drum.
11.	Perform necessary spill control functions (damning, diking, diverting and retention) to control runoff.
12.	Advance to the decontamination line for decontamination.
13.	

Overpack

Overpack a drum using the Rolling Slide-In, Slide-In and Slip-Over methods (NFPA 472 7.4.3(4))

Directions

For this skill students will overpack a leaking drum.

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Drum Upender
- 3 - 2" X 3' PVC Pipes
- Drum filled to at least 50% mark
- Overpack Drum
- Bung Wrench

Task Steps Overpack Rolling Slide-In Method

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Assess the damaged/leaking drum. <ul style="list-style-type: none">• Tighten bung• Repair any leaks using the appropriate method
5.	Place the damaged drum on the 3 PVC pipes using a drum upender or safe lifting techniques.
6.	Lay the overpack drum behind the damaged drum. Ensure the overpack drum is chocked to prevent rolling.
7.	Using the PVC pipes as rollers, roll the damaged drum into the overpack drum.
8.	Lift the overpack drum into an upright position using safe lifting techniques and attach the overpack drum lid.
9.	Label the overpack drum with a description of its contents.
10.	Perform necessary spill control functions (damning, diking, diverting and retention) to control runoff.
11.	Advance to the decontamination line for decontamination.

Task Steps Overpack Slide-In Method

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.

Task Steps Overpack Slide-In Method

3.	Avoid direct contact with the product.
4.	Assess the damaged/leaking drum. <ul style="list-style-type: none">• Tighten bung• Repair any leaks using the appropriate method
5.	The damaged drum and the overpack drum are placed end to end at an obtuse angle.
6.	The drums are then simultaneously rolled so that the damaged drum tends to work its way into the overpack drum.
7.	The inner drum will “foul out” inside the overpack drum, and inward progress will stop.
8.	The drums can be repositioned to reverse the original angle and rolled into the opposite direction.
9.	Continue this process until the damaged drum is worked most of the way into the overpack drum.
10.	Lift the overpack drum into an upright position using safe lifting techniques and attach the overpack drum lid.
11.	Label the overpack drum with a description of its contents.
12.	Perform necessary spill control functions (damning, diking, diverting and retention) to control runoff.
13.	Advance to the decontamination line for decontamination.

Task Steps Overpack Slip-Over Method

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Assess the damaged/leaking drum. <ul style="list-style-type: none">• Tighten bung• Repair any leaks using the appropriate method
5.	Lay damaged drum on its side, with bungs facing out, and place lid of overpack at the end with bungs.
6.	Using a drum upender, lift damaged drum onto the lid of the overpack, ensuring the bungs are facing down.
7.	Lift overpack over the damaged drum and slide over until it locks into lid and use the drum to tighten the lid.
8.	Using drum upender or safe lifting techniques, rotate drum from bottom side up to right side up position.
9.	Label the overpack drum with a description of its contents.
10.	Perform necessary spill control functions (damning, diking, diverting and

Task Steps Overpack Slip-Over Method

	retention) to control runoff.
11.	Advance to the decontamination line for decontamination.

Dome Clamp

Control a leak using a dome cover clamp. (NFPA 472, 7.4.3(8))

Directions

For this skill students will control a leak on an MC 306/DOT 406 dome using a dome clamp.

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Dome clamp(s)
- MC 306/DOT 406 with a dome cover or dome training prop
- Garden hose

Task Steps

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Place a suitable container below the dome to capture any product that may still be leaking.
5.	Assemble the appropriate number of dome clamps for deployment.
6.	Visually check the dome covers for any deformities and attempt to push the handle to close.
7.	Apply the dome clamp to each of the domes on the cargo tank.
8.	Tighten the dome clamps until the leak has stopped or is at a manageable flow.
9.	Perform necessary spill control functions (damning, diking, diverting and retention) to control runoff.
10.	Advance to the decontamination line for decontamination.

Pressure Vessel Leaks

Control leaks in a hazardous materials pressure vessel. (NFPA 472, 7.4.3(1))

Directions

For this skill students will control leaks in a hazardous materials pressure vessel (*Fusible plug, fusible plug threads, sidewall, valve blowout, valve seat, valve threads, valve gland and valve stem assembly*). Each of the above listed skills has two example skill sheets in this section. **It is only required to perform one of each of the skills. Students can perform all of the skills using the same prop or they can perform some on one prop and the rest on another prop.**

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Chlorine A Kit or Chlorine B Kit
- Leak Detection Solution
- Air Compressor/Hose
- 100-150lb or ton cylinder prop with water and air attachments
- Spray bottle
- Garden hose
-

Task Steps Fusible Plug Ton Cylinder	
1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	If plug has blown out drive a drift pin through plug opening, test for leaks.
5.	If step 4 fails apply the hood for fusible plugs and test for leaks. <ul style="list-style-type: none">• Fit yoke with stud over head of fusible plug• Place gasket against face of fusible plug• Tighten stud using wrench until the leak stops
6.	If the plug is intact drive a small drift pin through the plug, apply the hood for fusible plugs and test for leaks.
7.	Advance to the decontamination line for decontamination.

Task Steps Fusible Plug 100/150 Lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	If plug has blown out drive a drift pin through plug opening, test for leaks.
5.	If step 4 fails apply the hood for fusible plugs and test for leaks <ul style="list-style-type: none"> • Ensure that the gasket sealing surface of the fusible plug is clean • Loosen the set screw in the clamping device and place the device over the leaking valve • Place the gasket between the leaking fusible plug and the clamping device block • Tighten the set screw until the leak stops • Test for leaks
6.	If the plug is intact drive a small drift pin through the plug, apply the hood for fusible plugs and test for leaks.
7.	Advance to the decontamination line for decontamination.

Task Steps Fusible Plug Threads Ton Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Tighten the fusible plug using wrench and test for leaks. Use extreme caution when tightening the fusible plug to avoid breaking it off.
5.	If this fails apply the hood for fusible plugs and test for leaks. <ul style="list-style-type: none"> • Use a scraper to remove loose or uneven paint • Place gasket on hood • Fit yoke with stud over head of fusible plug • Place hood with gasket over yoke and stud so that stud extends out of the top of the hood • Place gasket over stud and screw cap nut onto stud • Using a wrench, tighten cap nut firmly enough that leak stops • Test for leaks
6.	Advance to the decontamination line for decontamination.

Task Steps Fusible Plug Threads 100/150 Lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Tighten the fusible plug using wrench 104 and test for leaks. Use extreme caution when tightening the fusible plug to avoid breaking it off.
5.	<p>If this fails apply the hood for fusible plugs and test for leaks.</p> <ul style="list-style-type: none"> • Using a hacksaw, saw the fusible plug off flush with the valve body • File the area until it is smooth • Place a gasket between the leaking fusible plug and the clamping device block • Tighten the set screw until the leak stops • Test for leaks
6.	Advance to the decontamination line for decontamination.

Task Steps Sidewall Ton Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Sound the sidewall for integrity.
5.	Clean surface around the location of the leak.
6.	<p>Place the sidewall leak assembly over the gasket, test for leaks.</p> <ul style="list-style-type: none"> • Adjust cap screw in yoke until point of screw extends only slightly below yoke • Slip one end of chain under container and pull it through until it reaches the approximate area of leak • Center cap screw in yoke in patch depression • Hook free ends of chain to ears on each side of yoke, keeping chain as short as possible • Place gasket and patch over leak • Tighten cap screw using wrench • Test for leaks
7.	Advance to the decontamination line for decontamination.

Task Steps Sidewall 100/150 Lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Sound the sidewall for integrity.
5.	Clean surface around the location of the leak.
6.	Place a gasket over the leak and place the sidewall leak assembly over the gasket, test for leaks. <ul style="list-style-type: none"> • Slip one end of strap under/around container and pull it through until it reaches the approximate area of leak • Place button gasket inside of patch. Ensure adjusting screws are fully retracted into patch • Center cap screw in yoke in patch depression • Hook free ends of strap to ears on each side of yoke • Place gasket and patch over leak • Hand-tighten cap screw until leak stops • Tighten thumb screws until touching cylinder – do not over tighten • Test for leaks
7.	Advance to the decontamination line for decontamination.

Task Steps Valve Blowout Ton Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Attempt to position container so that leaking valve is in the uppermost position, immediately drive large drift pin into valve opening and apply hood/bar assembly. <ul style="list-style-type: none"> • Remove outlet cap from vent valve on hood and open valve • Loosen adjusting screws and retract jack screws sufficiently to allow insertion of adjustable bar assembly behind chime of container. The bar assembly must be applied in the vertical position. • Clean head container around leaking valve; use scraper if paint is loose or uneven • Place molded gasket on hood. Place hood with molded gasket over leaking valve • Adjust lower jack screw to center one cap screw over hood and adjust

Task Steps Valve Blowout Ton Cylinder

	<p>upper jack screw so that adjustable bar assembly fits tightly inside chime. Using wrench tighten adjusting screws</p> <ul style="list-style-type: none"> • Using wrench tighten cap screw forcing hood and gasket against head container. Tighten just enough to stop leak • Close vent valve on hood using wrench and test for leaks
5.	Advance to the decontamination line for decontamination.

Task Steps Valve Blowout 100/150lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	<p>Access the leak immediately drive large drift pin into valve opening and apply hood assembly.</p> <ul style="list-style-type: none"> • Remove outlet cap from vent valve on hood and open valve • Prepare base assembly with chains set in outer most position • Roll upright cylinder and center in position on base assembly • Clean shoulder of cylinder: Use scraper if paint is loose or uneven • Inspect condition of gasket. Place gasket on hood. Center hood with gasket over leaking valve • Attach chains from base to corresponding hooks on hood. Hooks should be in lowest position by turning bolts. Ensure that chains are straight and not twisted. Attach chains to hook with appropriate link to avoid slack in chains. Base of chains should be flush with bottom of cylinder • Hand-tighten cap screws equally, forcing the hood and gasket against the shoulder of cylinder. Over tightening may damage gasket. If leak persists tighten cap screws further in area of leak • Close vent valve and test for leaks
5.	Advance to the decontamination line for decontamination.

Task Steps Valve Seat Leak Ton Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification
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Task Steps Valve Seat Leak Ton Cylinder

	tests required before performing any leak control measures.
2.	Wearing appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Apply outlet cap and gasket.
5.	Tighten with wrench.
6.	Test for leaks
7.	Advance to the decontamination line for decontamination.

Task Steps Valve Seat Leak 100/150 Lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
3.	Apply outlet cap and gasket.
4.	Tighten with wrench.
5.	Test for leaks
6.	Advance to the decontamination line for decontamination.

Task Steps Valve Threads Ton Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	<p>Attempt to tighten valve into the container body and apply hood/bar assembly.</p> <ul style="list-style-type: none"> • Remove outlet cap from vent valve on hood and open valve • Loosen adjusting screws and retract jack screws sufficiently to allow insertion of adjustable bar assembly behind chime of container. The bar assembly must be applied in the vertical position. • Clean head container around leaking valve; use scraper if paint is loose or uneven • Place molded gasket on hood. Place hood with molded gasket over

Task Steps Valve Threads Ton Cylinder

	<p>leaking valve</p> <ul style="list-style-type: none"> • Adjust lower jack screw to center one cap screw over hood and adjust upper jack screw so that adjustable bar assembly fits tightly inside chime. Using wrench tighten adjusting screws • Using wrench tighten cap screw forcing hood and gasket against head container. Tighten just enough to stop leak • Close vent valve on hood using wrench and test for leaks
5.	Advance to the decontamination line for decontamination.

Task Steps Valve Threads 100/150lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	<p>Tighten valve into cylinder using wrench and apply hood assembly.</p> <ul style="list-style-type: none"> • Remove outlet cap from vent valve on hood and open valve • Prepare base assembly with chains set in outer most position • Roll upright cylinder and center in position on base assembly • Clean shoulder of cylinder: Use scraper if paint is loose or uneven • Inspect condition of gasket. Place gasket on hood. Center hood with gasket over leaking valve • Attach chains from base to corresponding hooks on hood. Hooks should be in lowest position by turning bolts. Ensure that chains are straight and not twisted. Attach chains to hook with appropriate link to avoid slack in chains. Base of chains should be flush with bottom of cylinder • Hand-tighten cap screws equally, forcing the hood and gasket against the shoulder of cylinder. Over tightening may damage gasket. If leak persists tighten cap screws further in area of leak • Close vent valve and test for leaks
5.	Advance to the decontamination line for decontamination.

Task Steps Valve Stem Blowout Ton Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product
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Task Steps Valve Stem Blowout Ton Cylinder

	is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	<p>Attempt to position container so that leaking valve is in the uppermost position, immediately drive large drift pin into valve stem opening and apply hood/bar assembly.</p> <ul style="list-style-type: none"> • Remove outlet cap from vent valve on hood and open valve • Loosen adjusting screws and retract jack screws sufficiently to allow insertion of adjustable bar assembly behind chime of container. The bar assembly must be applied in the vertical position. • Clean head container around leaking valve; use scraper if paint is loose or uneven • Place molded gasket on hood. Place hood with molded gasket over leaking valve • Adjust lower jack screw to center one cap screw over hood and adjust upper jack screw so that adjustable bar assembly fits tightly inside chime. Using wrench tighten adjusting screws • Using wrench tighten cap screw forcing hood and gasket against head container. Tighten just enough to stop leak • Close vent valve on hood using wrench and test for leaks
5.	If the hood/bar assembly will not fit over the drift pin isolate the container and notify chlorine supplier and monitor.
6.	Advance to the decontamination line for decontamination.

Task Steps Valve Stem Blowout 100/150lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing the appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	<p>Tighten valve into cylinder using wrench and apply hood assembly.</p> <ul style="list-style-type: none"> • Remove outlet cap from vent valve on hood and open valve • Prepare base assembly with chains set in outer most position • Roll upright cylinder and center in position on base assembly • Clean shoulder of cylinder: Use scraper if paint is loose or uneven • Inspect condition of gasket. Place gasket on hood. Center hood with

Task Steps Valve Stem Blowout 100/150lb Cylinder

	<p>gasket over leaking valve</p> <ul style="list-style-type: none">• Attach chains from base to corresponding hooks on hood. Hooks should be in lowest position by turning bolts. Ensure that chains are straight and not twisted. Attach chains to hook with appropriate link to avoid slack in chains. Base of chains should be flush with bottom of cylinder• Hand-tighten cap screws equally, forcing the hood and gasket against the shoulder of cylinder. Over tightening may damage gasket. If leak persists tighten cap screws further in area of leak• Close vent valve and test for leaks
5.	If the valve hood assembly will not fit over the drift pin isolate the container and notify chlorine supplier and monitor.
6.	Advance to the decontamination line for decontamination.

Task Steps Valve Gland Leak Ton Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Tighten valve gland nut with wrench.
5.	Test for leaks.
6.	Advance to the decontamination line for decontamination.

Task Steps Valve Gland Leak 100/150 Lb Cylinder

1.	Attempt to identify the product and conduct a hazard assessment. If the product is unknown perform the appropriate air monitoring and chemical classification tests required before performing any leak control measures.
2.	Wearing appropriate PPE, approach the location from uphill and upwind.
3.	Avoid direct contact with the product.
4.	Tighten valve gland nut with wrench.
5.	Test for leaks.
6.	Advance to the decontamination line for decontamination.

Decontamination

Technical Decontamination

Perform technical decontamination operations in support of entry operations. (NFPA 472, 7.4.5(1))

Directions

For this skill students will set up and perform technical decontamination of the entry and back up personnel as necessary.

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Tarps, salvage covers, or plastic sheeting
- Traffic cones
- Buckets
- Catch basin or pool
- Trash bags
- Scrub brushes
- Sprayers
- Pump
- Soap
- Hoses and attachments
- Water supply
- Hose manifold
- Bags for personal items
- Portable shower
-

Task Steps Technical Decontamination Set Up

1.	Ensure that all responders are wearing appropriate PPE for establishing the decon corridor and performing technical decontamination operations.
2.	Set up the decontamination corridor uphill and upwind from the hot zone, away from remote drains or waterways.
3.	Mark entry and exit of decontamination corridor so that they are clearly identified.
4.	Set up ground cover (tarp or salvage cover) for secondary contamination and runoff containment.
5.	Establish a tool-drop station in the hot zone at the entry to the decontamination

Task Steps Technical Decontamination Set Up

	corridor. Note: The number of stations in the decon corridor will vary depending on the needs of the incident and local SOPs. Law enforcement personnel may need a separate decontamination station for tactical equipment.
6.	Establish a gross decontamination station after the tool-drop station in the decontamination corridor.
7.	Establish a secondary decontamination station including appropriate cleaning solution(s) as set forth by the haz mat technician, SOPs, or allied professional.
8.	Establish a PPE removal station with waste disposal containers for contaminated PPE.
9.	Establish a respiratory protection removal station. Note: Steps 8 and 9 may need to be reversed, depending on the PPE worn.
10.	Establish an undergarment removal station with waste disposal containers for contaminated clothing.
11.	Establish shower and clothing change station.
12.	Establish a medical evaluation area.

Task Steps Perform Technical Decontamination

1.	Greeter instructs entry personnel to drop tools and equipment at tool drop area.
2.	Greeter meets entry member coming into the line Checks air supply and suits.
3.	Instructs most critical proceed to boot and glove wash.
4.	Instruct entry member to enter gross rinse. Remove as much contaminate as possible.
5.	Instruct member to advance to wash station start washing at the top with soap completely wash member. <ul style="list-style-type: none"> • Have member stand with arms extended out to their sides • Wash front from head to toe and rinse • Instruct member to turn clockwise 180° • Wash back from head to toe and rinse • Instruct member to grab the walker and lift one boot • Wash the bottom of the boot and have member step out of the pool with that boot • Instruct member to lift the other boot • Wash the bottom of the boot and have member step out of the pool with that boot • Have member repeat this process through all wash/rinse stations
6.	Instruct member to advance to monitoring station, establishing member is free of contamination.
7.	Instruct member to advance to the Doffing area, where CPE is removed. The decontamination personnel <ul style="list-style-type: none"> • Unzips suit

Task Steps Perform Technical Decontamination

	<ul style="list-style-type: none">• Peels the suit away from the wearer and clears the SCBA• Has the wearer pull their arms out of the suit• Pulls the suit down the legs and assists wearer out of their boots• Takes suit and boots and places them in the "dirty equipment area" for disposal
8.	Remove SCBA and place it in designated clean area (if decontaminating personnel in "Level B" with the SCBA exposed the SCBA should be removed from wearer and held by wearer during the decontamination process. The facepiece should remain in place until the CPE is doffed.)
9.	Instruct member to proceed to medical monitoring and rehabilitation
10.	
11.	
12.	

Mass Decontamination

Perform mass decontamination operations. (NFPA 472, 7.4.5(3))

Directions

For this skill students will set up and perform mass decontamination of exposed and contaminated people as necessary.

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Tarps, salvage covers, or plastic sheeting
- Traffic cones
- Trash bags
- Water supply
- Pumper/Aerials
- Bags for personal items
- Fog Nozzles
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-
-
-
-

Task Steps Set Up and Perform Mass Decontamination

1.	Ensure responders are in appropriate PPE for conducting mass decontamination activities. (This is based on the product and incident conditions)
2.	Establish a mass decontamination area in the warm zone. **Note** It is recommended that victim modesty be taken into consideration. If possible separate male and female victims. Also, female responders should be utilized when assisting female victims and male responders when assisting male victims. This is especially true when assisting victims.
3.	Have exposed/contaminated victims stage in the "Area of Refuge"

Task Steps Set Up and Perform Mass Decontamination

4.	Mass decon can be set up by placing two pumpers side by side and placing fog nozzles in the discharges or using the master stream fog nozzle on the tip of an aerial apparatus. **Note** Attempt to contain runoff if possible. If it is not possible to contain the runoff ensure that storm drains are blocked prior to beginning mass decontamination."
5.	Salvage covers or tarps can be used as curtains to assist with privacy. **Note** Life safety always overrides modesty/privacy. This step should be accomplished if possible but is not necessary if the delay would cause further harm to the victims.
6.	Direct victims to remove contaminated clothing and place them in a designated area.
7.	Properly bag/tag all valuables.
8.	Direct victims to proceed through the mass decontamination area.
9.	Provide victims with a comfort bag that includes (a towel, gown and booties).
10.	Direct victims to the EMS area.
11.	Discontinue mass decontamination operations.
12.	Decontaminate emergency response personnel as necessary.
13.	Ensure runoff is taken care of.

Decontamination of Ambulatory and Non-Ambulatory Victims

Perform technical decontamination operations of ambulatory and non-ambulatory victims.
(NFPA 472, 7.4.5(2))

Directions

For this skill students will set up and perform technical decontamination of a ambulatory and non-ambulatory victims as necessary.

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Tarps, salvage covers, or plastic sheeting
- Traffic cones
- Buckets
- Catch basin or pool
- Trash bags
- Scrub brushes
- Sprayers
- Pump
- Soap
- Hoses and attachments
- Water supply
- Hose manifold
- Bags for personal items
- Portable shower
- Clean garments for victims to wear after showering
- Carts or skids
- Backboard or litter
- Saw horse or conveyor system
-

Task Steps Set Up and Perform Decontamination for Ambulatory Victims

Task Steps Set Up and Perform Decontamination for Ambulatory Victims

1.	Ensure that all responders are wearing appropriate PPE for establishing the decon corridor and performing technical decontamination operations.
2.	Set up the decontamination corridor for ambulatory victims uphill and upwind from the hot zone, away from remote drains or waterways. Ensure a privacy area/tent is provided for victims. <ul style="list-style-type: none"> • Contaminated outer clothing drop • Gross wash • Secondary wash • Personal shower • Clothing station
3.	Mark entry and exit of decontamination corridor so that they are clearly identified.
4.	Set up ground cover (tarp or salvage cover) for secondary contamination and runoff containment.
5.	Establish a triage area for victim assessment.
6.	Direct victims to remove potentially contaminated outer clothing and place them in the designated area. All valuables should be bagged and tagged.
7.	Direct victims to gross wash/shower station.
8.	Direct victims to secondary wash. Ensure male responders conduct decontamination on male victims and female responders for female victims.
9.	Direct victims to enter the privacy station, remove undergarments, and shower and wash thoroughly from the top down. **Note** Do NOT ask members of the public to remove their clothes to shower unless complete privacy is provided.
10.	Direct victims to take a "comfort bag" (with towel, gown and booties) to the clothing station.
11.	Monitor victims for the presence and contaminants. If necessary have victims repeat process and consider changing decontamination methods.
12.	Direct victims to EMS for evaluation.
13.	Provide decontamination for all responders

Task Steps Set Up and Perform Decontamination for Non-Ambulatory Victims

1.	Ensure that all responders are wearing appropriate PPE for establishing the decon corridor and performing technical decontamination operations.
2.	Set up the decontamination corridor for non-ambulatory victims uphill and upwind from the hot zone, away from remote drains or waterways.
3.	Mark entry and exit of decontamination corridor so that they are clearly identified.
4.	Set up ground cover (tarp or salvage cover) for secondary contamination and runoff containment.
5.	Establish a triage area for victim assessment.

Task Steps Set Up and Perform Decontamination for Non-Ambulatory Victims

6.	Transfer the victim to the non-ambulatory wash area of the decontamination station on an appropriate backboard/litter device.
7.	Remove all clothing, jewelry, and personal belongings, and place in appropriate containers. Decontaminate as required, and safeguard. Use plastic bags with labels for identification.
8.	Carefully undress non-ambulatory persons, and avoid spreading the contamination when undressing. Do not touch the outside of the clothing to the skin. If biological agents are suspected, a fine water mist can be applied to trap the agent in the clothing and prevent the spread of contamination.
9.	Completely wash the victim's entire body using handheld hoses, sponges, and/or brushes and then rinse.
10.	Clean the victim's genital area, armpits, folds in the skin, and nails with special attention. If conscious, instruct the victim to close his/her mouth and eyes during wash and rinse procedures.
11.	Transfer the victim from the wash and rinse stations to a drying station after completing the decontamination process. Ensure that the victim is completely dry.
12.	Monitor for additional contamination using the appropriate detection device. **Note** If contamination is detected, repeat decontamination wash and/or change decontamination method, as appropriate.
13.	Have on-scene medical personnel reevaluate the victim's injuries.

Information Analysis

Chemical Research and Analysis

Collect and interpret hazard and response information not available from the current edition of the DOT *Emergency Response Guidebook* or an MSDS. (NFPA 472, 7.2.2)

Given five hazardous materials/WMD scenarios identify the signs and symptoms of exposure to each material and the target organ effects of exposure. (NFPA 472, 7.2.2.4)

Directions

For this skill students will use reference materials to collect and interpret hazard data, response information and identify the signs and symptoms of exposure that includes effects on target organs. This will be accomplished on five separate materials using at least three reference materials in addition to the ERG or MSDS. Students will document their findings on a data sheet. Instructors can add to the data sheet or associated questions as necessary.

Equipment & Materials

- Chemical reference sources
- Data sheet
-
- Five chemical materials
- Chemical database
-

Skills Evaluation Checklist

Task Steps

Task Steps

1.	Using five identified chemicals and a variety of research materials identify the following; <ul style="list-style-type: none">• CAS #• UN ID and hazard class• EPA RQ and TPQ quantities• NFPA 704• Flammability properties• Physical properties• Signs/Symptoms of Exposure• Reactivity properties• Toxicity properties• Incompatibilities
2.	Complete data sheet
3.	Answer associated questions

Student: _____ Course# _____ Date: _____

Chemical Name:	CAS#	UN#
----------------	------	-----

Reference

Reference

Reference

Reference

Properties				
Physical State				
pH				
Ionization Potential				
Flash Point				
Ignition Temperature				
LEL				

UEL				
Vapor Pressure				
Vapor Density				
Specific Gravity				
IDLH				
TLV/TWA				
TLV-C				
Routes of Entry				
Signs/Symptoms/Target Organ(s)				

Associated Questions

Student: _____ Course# _____ Date: _____

Chemical Name:	CAS#	UN#
----------------	------	-----

Answer the following questions using the findings of the corresponding data sheet. If the information necessary was not found in the reference materials used attempt to find the information from other sources.

1. What is the primary hazard of the product? List any other significant hazards found.

2. What is the initial isolation distance and subsequent downwind protections (if any)?

3. What PPE is required for entry and decontamination and what was the reason for the selection?

4. Which monitoring equipment will work best for the product?

5. Can a PID be used to detect this material? If so what size bulb is required? _____

Determine Dispersion Pattern

Estimate the likely size, shape, and concentrations associated with the release of materials involved in an incident by using computer modeling. (NFPA 472, 7.2.5)

Directions

For this skill students will use computer based modeling software such as Cameo, Aloha and Marplot to determine the likely dispersion model for the hazard area. Students will be given the product, container information, weather information, and spill/leak information. Students will calculate various hazard areas and the concentration within those areas. With these calculations they will determine likely public protection options and resource needs.

Equipment & Materials

- Chemical reference sources
- Data sheet
-
- Five chemical materials
- Chemical database
-

Skills Evaluation Checklist

Task Steps	
1.	Start Cameo Chemicals program.

Task Steps

2.	Click "Search" and type Name, CAS# or UN# in appropriate field and click on appropriate search button.
3.	Click "Datasheet" button, here you will find a great deal of chemical information. If you have multiple chemicals involved or if you wish to bookmark this chemical for later click "Add to my Chemicals" button.
4.	Search for additional chemicals (if necessary) and add to your "My Chemicals" list.
5.	Click "Predict Reactivity" button in the left column. This will give an overview of what to expect if you're my chemicals list were to mix.
6.	Select one of the chemicals in you're my chemicals list (if you have more than one chemical).
7.	Click the "Sharing" button at the top of the page. Select "Go to Aloha"
8.	Click "Site Data" then "Location" and select your location.
9.	From the Cameo Chemical, Click "Sharing" and then "Select this Chemical in Aloha"
10.	From Aloha click "Set Up" and the "Weather" and input known weather information (Wind speed and direction, cloud cover) click "Ok". Then add air temperature and humidity (leave stability class and inversion set at default).
11.	From Aloha click "Set Up" then "Source" then the appropriate source. From the pages of the source selected enter the requested information. **Note** During this portion some speculation may be required for the completion of this section.
12.	Start "Marplot" program
13.	Select the binocular picture in the "Search & Get Info" section at the top of the page. Then select "Address" type in all or partial address. If you have trouble locating the address you can change the "Base Map" on the right side of the page at the bottom. Once you have located the address place the cursor on the exact location of the incident.
14.	Click on the "Aloha" button and select "Set Source Point at Click Point"
15.	From the Aloha program select "Display" then "Threat Zone" then select "Sharing" then "Marplot" and then "Go to Map". This will display your area of concern on the map.
16.	If you are concerned about a particular point you can select "Display" in Aloha and then "Threat at Point" enter in the particular information and this will give approximate values at the point selected.
17.	Explore the various functions of each of the programs as time allows.

Incident Scenario

Given a hazardous materials scenario develop an Incident Action Plan, Site Safety Plan. Establish and demonstrate the duties working within an Incident Command System. Collect and analyze hazard and response information, estimate the size of the endangered area using computer based modeling software and monitoring/detection equipment, select appropriate public protection options. Select, don, work in and doff appropriate PPE. Select, perform and evaluate control measures established in the IAP. Select, set up, perform and evaluate technical decontamination. Perform incident termination activities to include completing required reports, assist in an incident debriefing and assist in an incident critique. (NFPA 472, 7.1.2.2(1 b, 1e, 2e, 3a, 5 a-c) 7.2.2, 7.2.2.4, 7.2.5(1-4), 7.3.5(1, 2), 7.4.1, 7.5.1, 7.5.2, 7.6.2)

Directions

For this skill, as a group students will be given a hazardous materials scenario. This scenario shall be live, hands on exercise. Students shall establish an incident command system with an incident commander, command staff and hazardous materials branch. Develop an incident action plan, determine a hazard area using computer modeling software and monitoring devices, perform rescues, simulate public protection measures, perform control measures, establish and perform all decontamination activities required, and conduct incident termination activities.

Equipment & Materials

- Appropriate personal protective equipment (PPE)
- Reference material
- All leak control equipment
- All decontamination equipment
- Smoke machine
-
-
-
- Scenario
- Computer with modeling software
- Leak prop
- Rescue manikin
-
-
-

Task Steps	
1.	Instructor/Evaluator set up and present scenario.
2.	Students establish an Incident Commander
3.	<p>Incident Commander assigns</p> <ul style="list-style-type: none"> • Safety Officer • Ops Officer • Science Officer • Entry/Back Up Team • Decontamination Team <p>**Note** Additional positions may include PIO and Liaison based on adequate personnel. Scene security can be simulated. Public protection (evacuation/shelter in place) can be simulated. Based on the number of students the scenario may be run in separate segments.</p>
4.	Establish an Incident Action Plan based on incident condition, material research, site characterization and resources available. Necessary logs shall be kept up to date in real time throughout the incident.
5.	Set up all necessary decontamination area(s). Use decontamination skill sheets with this item.
6.	Set up monitoring equipment. Use monitoring skill sheets with this item.
7.	Perform pre-entry medical evaluations and PPE inspections.
8.	Perform rescues as necessary.
9.	Entry team(s) shall perform site reconnaissance, monitoring and hazard mitigation as established in the incident action plan. This may require the use of multiple entry teams. Use monitoring, leak control and spill control skill sheets with this item.
10.	Decontamination team(s) shall decontaminate all victims, responders and equipment. Use decontamination skill sheets with this item.
11.	<p>Assemble and complete reports</p> <ul style="list-style-type: none"> • SCBA on and off air times

Task Steps	
	<ul style="list-style-type: none"> • Hot zone entry and exit logs • Activity logs • Exposure logs • Incident report • Site Safety Plan • Equipment log • Personnel accountability log
12.	Conduct incident debriefing <ul style="list-style-type: none"> • Discuss material involved to include s/s of exposure • Explain exposure reporting procedures • Damaged equipment • Expended materials • Assign POC for gathering information and report completion for the post incident analysis and critique
13.	Conduct After Action Report/Critique <ul style="list-style-type: none"> • Ensure all incident documentation is completed • Discuss what worked and what did not • Avoid finger pointing • Establish equipment needs • Establish necessary policy changes • Establish training needs